

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Permission may be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses and that the permissible methods of taking and requirements pertaining to the monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Subsection 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Under section 3(18)(A), the MMPA defines "harassment" as:

...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

The term "Level A harassment" means harassment described in subparagraph (A)(i). The term "Level B harassment" means harassment described in subparagraph (A)(ii).

Section 101(a)(5)(D) establishes a 45-day time limit for NMFS review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of small numbers of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny issuance of the authorization.

Summary of Request

On June 16, 2003, NMFS received an application from SIO for the taking, by

harassment, of several species of marine mammals incidental to conducting a seismic survey program in international waters of the ETP and in several Exclusive Economic Zones (EEZ) of several coastal states (Mexico, Costa Rica, Panama, Columbia, Ecuador, and Peru), from which permission to conduct this type of scientific research has been requested. SIO's *R/V Roger Revelle* is scheduled to undertake a multidisciplinary research cruise, including some seismic reflection profiling and echo-sounding studies, in the ETP from September 2003 to February 2004, primarily 100–400 nautical miles (nm) (185 - 741 km) west of northern Peru and 200–1000 nm (370 - 1852 km) west of the Galapagos Islands. None of these operations would be in U.S. territorial waters or in the U.S. EEZ. A low-energy seismic reflection profiler with a small airgun sound source will be used on 3 of the 8 legs of the cruise. The purpose of this survey is to study the shape and structure of the sediment-buried oceanic crust in this part of the ETP.

Description of the Activity

SIO's seismic surveys will involve one vessel, the *R/V Roger Revelle* (under a cooperative agreement with the U.S. Navy, owner of the vessel). The *Roger Revelle* will deploy two airguns as an energy source, plus a single short (300 m or 984 ft) towed streamer of hydrophones to receive the returning acoustic signals, that can be retrieved and deployed in less than 20 minutes.

The bubble-generating chambers of the two small General-Injector airguns have a combined volume of 90 cubic inches (1475 cubic centimeters (cc)), contrasting with 3000–9000 cubic inches (49,161–147,484 cc) of the large gun arrays typical of academic and commercial seismic surveys. The primary seismic pulse is produced by a 45-in3 (737 cc) generator chamber, while compressed air from a 105-in3 (1721 cc) injector chamber is used to maintain the shape of the bubble and reduce its sound-making oscillation. The pair of simultaneously fired airguns would have a peak-to-peak (p-p) amplitude of 236 dB re 1 μ Pa. In addition, a hull-mounted mid-frequency multibeam echo-sounder sonar for seafloor mapping will be routinely operated whenever the *Revelle* is underway. The Kongsberg-Simard EM-120 sonar images the seafloor over a 120–140 degree-wide swath (about 10–20 km, or 5–10 nm wide), using very short (15 msec) transmit pulses with a 10–20 second repetition rate and a 11.25–12.60 kHz frequency sweep. Source level in deep water is 240 dB

rms, but the brevity, directivity, and narrow beam-width (1 degree fore-and-aft) of the transmit pulses make it unlikely that operation of this depth sonar will affect marine mammals.

None of the 3 research legs for which an IHA is requested will be a dedicated seismic reflection survey of the sort typically conducted by a specialized seismic vessel. The seismic reflection profiler will be used as just one tool in integrated marine geology and geophysical studies that also employ bathymetric echo-sounders, passive geophysical sensors (such as a gravimeter and magnetometer), and geologic sampling tools (like rock dredges and cores). Typical operating procedure during these three legs of the cruise will be to conduct seismic profiling, at a ship speed of 9–11 knots for periods of 8–12 hours, interspersed with episodes of geologic sampling and periods of faster steaming with no profiling system deployed. In a few instances (1–3 per leg), longer profiles will need to be collected, requiring up to 36 hours of continuous airgun operation. The objective is not to image deep crustal structure or the stratigraphy of thick sedimentary units (the typical goals of seismic surveys); instead the purpose is to measure the varying thickness of the 100–400 m-thick (328–1312 ft) cover of pelagic sediment that buries and obscures the igneous oceanic crust in our study areas, because establishing the relief of the buried crust is essential for interpreting the bathymetric, magnetic and gravity data. For this limited objective, the large powerful sound sources and hydrophone streamers several kilometers long that typify dedicated seismic surveys are not required. Nor will any broad ocean volume be ensounded by profiling on closely-spaced seismic lines.

Leg 1 of the cruise, from San Diego to Puerto Caldera, Costa Rica, is planned for September 27–October 9, 2003. This will be primarily a staging and instrument testing and calibration leg, but with 2 days of seismic reflection profiling and rock-dredging 40–80 nm (74–148 km) off the coast of Costa Rica. In addition to the approximately 24 hours of seismic profiling, it is also planned during this leg to test and calibrate new components of the system, and train shipboard technicians in their use, with 2 or 3 12–18 hour test runs along parts of the transit track. Because these test profiles may obtain scientifically useful data, specific sites that are of interest to Mexican researchers have been targeted, in partial fulfillment of SIO's foreign-